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 ФИО: Косенок Сергей Михайлович
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Assessment tools for midterm assessment

“Pathophysiology”

Curriculum	31.05.01
Specialty	General Medicine
Form of education	Full-time
Designer Department	Pathophysiology and General Pathology
Graduate Department	Internal Diseases

Sample tasks and tests

Term 5, 6

TEST (5, 6 term)

The test is carried out with the aim of monitoring students' assimilation of knowledge from the lecture course, assessing the knowledge and skills acquired during practical classes, as well as testing the ability to solve various types of problems that develop professional abilities in accordance with the requirements of the specialist's qualification characteristics. Test work is carried out according to the schedule during class hours in the amount provided for by the syllabus and the teaching load of the teacher. The time to prepare for the test is included in the hours of students' self-study and should not exceed 4 hours. The test work is assessed using a differentiated assessment. In case of an unsatisfactory grade received by the student, a new deadline for writing the test work outside of class time is assigned.

Assessment of practical skills using simulation and using artificial materials (mannequins) or the participation of third parties may include demonstration of manipulations and oral answers to task questions.

- Assessment of bedside skills may include demonstration of detection and/or interpretation of signs, symptoms, examination and treatment;
- The task may include a brief introductory part (conditions of the task), questions, and a list of practical skills for demonstration. The content of the assignments should not go beyond the scope of the curriculum.

When assessing, the teacher takes into account:

- *knowledge of factual material on the program;*
- *ability to apply theoretical knowledge in practice;*
- *the level of development of the student's practical skills;*
- *logic and response style;*
- *reasoning for the choice of additional examination data, differential diagnosis and/or its justification, choice of treatment, level of clinical thinking.*

Term 5

Test (Essay)

List of topics:

Introduction. Subject and tasks of pathophysiology.

1. Terminal states. Dying as a staged process. Pre-agony, agony, clinical death, biological death.
2. Pathophysiological basis of resuscitation. Principles of restoration of blood circulation, breathing, correction of metabolic disorders.
3. Post-resuscitation illness. Irreversible changes after resuscitation.

Cell pathology.

1. The role of calcium in the pathogenesis of cell damage.
2. Lipid peroxidation is one of the mechanisms of membrane damage.
3. Factors of intercellular interaction.

Disorders of peripheral circulation and microcirculation.

1. Modern ideas about the mechanisms of thrombus formation.
2. The influence of chemical and hormonal factors on the functions and structure of the vessels of the myrocircular bed.

Pathophysiology of hemostasis.

1. Hereditary hemophilia.
2. Hemorrhagic vasculitis.

Inflammation.

1. The role of lysosomal factors in the pathogenesis of inflammation.
2. Mediators and modulators of inflammation.
3. The influence of nervous and hormonal factors on the development of inflammation.

Pathophysiology of the immune system. Allergy. Types and mechanisms of allergic reactions.

1. The mechanism of delayed-type allergic reactions.
2. Mechanisms of autoallergic diseases.

Acute phase response. Fever. Hyperthermia.

1. Principles of antipyretic therapy. The concept of pyrotherapy. Antipyresis.
2. Dependence of fever on the properties of the pyrogenic factor and the reactivity of the body. Participation of the nervous, endocrine and immune systems in the development of fever.

Body reactivity and its significance in pathology. Adaptation. Constitution of the body.

1. Biorhythms and chronopathology.
2. Concepts about geriatrics and gerontology.
3. Aging of the body. Theories of aging.
4. Features of the development of pathological processes in elderly and senile people

Typical acid-base disorders.

1. The mechanism of acid-base imbalance in diabetic coma.
2. Principles of modern diagnosis and correction of acid-base imbalance.

Typical disorders of water and electrolyte metabolism. Edema.

1. The role of sodium and potassium metabolic disorders in the development of edema.

Pathophysiology of protein and fat metabolism.

1. Diabetes mellitus and reactivity.
2. The role of corticosteroids in the pathogenesis of diabetes mellitus.

Pathophysiology of carbohydrate metabolism. Obesity. Diabetes.

1. Metabolic disorders in diabetes mellitus. Complications of diabetes mellitus, their mechanisms.
2. Diabetic comas (ketoacidotic, hyperosmolar, lactic-acidemic, hypoglycemic). Their pathogenetic features.
3. Pathogenesis of long-term consequences of diabetes mellitus.

The role of heredity in pathology.

1. Mutations and antimutation barriers.
2. Medical and social consequences of alcoholism and drug addiction.

Impact of environmental factors on the body.

1. Causes and mechanisms of development of the consequences of exposure to small doses of ionizing radiation on the body.
2. Molecular mechanisms of the damaging effects of ionizing radiation.
3. Compensatory and restoration reactions under the influence of ionizing radiation.

Term 6

Test (Essay)

List of topics:

Coronary insufficiency. Atherosclerosis.

1. Effect of β -blockers in coronary insufficiency.
2. Perfusion cardiac syndrome.

Overload and metabolic heart failure.

1. Stenosis and insufficiency of the mitral and aortic valve as one of the causes of the development of acute heart failure.
2. Emergency stage of compensatory myocardial hypertrophy. The mechanism for triggering DNA and protein synthesis.

Circulatory disorders in vascular tone disruptions.

1. Arterial hypertension during pregnancy. Preeclampsia. Eclampsia.

Cardiac arrhythmias.

1. Accelerated atrioventricular conduction syndromes (Wolf-Parkinson-White syndrome. Clerk-Levy-Christesco syndrome).
2. Principles of treatment of cardiac arrhythmias.

Pathophysiology of breathing.

1. Asphyxia. Stages of development. Development mechanism.
2. Surfactant system of the lungs, its purpose, causes and consequences of its damage.

Pathophysiology of digestion.

1. The relationship between parietal and cavity digestion in pathological conditions.
2. Consequences of removal of various parts of the gastrointestinal tract.

Peptic ulcer of the stomach and 12th intestine. Diseases of the pancreas. S-m Malabsorption and maldigestion.

1. The relationship between parietal and cavity digestion in pathological conditions.
2. Consequences of removal of various parts of the gastrointestinal tract.

Pathophysiology of the liver.

1. Cirrhosis of the liver. The mechanism of development of portal hypertension in cirrhosis, its consequences.
2. The mechanism of development of hepatic lumps. Impaired detoxification function of the liver.

Pathophysiology of the kidneys. Uremia. Uremic coma.

1. Methods of extracorporeal hemocorrection for kidney diseases.
2. Uremic coma.

Pathophysiology of the hypothalamic-pituitary system, thyroid and parathyroid glands.

1. Postpartum hypopituitarism (Sheehan syndrome).
2. Diffuse toxic goiter (Graves disease). Nodular toxic goiter (Plummer's disease).

Pathophysiology of the adrenal glands and genital glands.

1. Cushing's syndrome. Waterhouse-Friderichsen syndrome.

2. Klinefelter's syndrome. Shereshevsky-Turner syndrome.

Disorders of the red blood cell system.

1. The role of erythropoietin, cytokines and anti-cytokines in the regulation of hematopoiesis.
2. Erythroblastosis of newborns.

Disorders of the leukocyte system.

1. The role of humoral factors in the regulation of hematopoiesis.
2. Histochemical characteristics of blast cells.

General etiology and mechanisms of damage to the nervous system. Pathophysiology of pain.

1. The mechanism of memory impairment.
2. Contribution of L.A. Orbeli and A.D. Speransky in the development of the doctrine of nervous trophism and neurogenic dystrophy
3. Pathophysiological basis of pain relief; reflexology.
4. Spinal shock. Deafferentation syndrome

Term 6

SAMPLE QUESTIONS FOR THE EXAM (6th term)

The exam tasks contain three theoretical questions.

The task for competence assessment “Know”	Task type
<p>Give detailed answers to the following theoretical questions:</p> <p>Maintaining. General nosology</p> <ol style="list-style-type: none">1. General nosology as a section of pathophysiology. Basic concepts of general nosology: pathological reaction, pathological process, pathological condition. Examples. The concept of a typical pathological process.2. Disease. Disease as a dialectical unity of damage and adaptive reactions of the body. Stages of the disease. Disease criteria. Principles of classification of diseases.3. General etiology. The role of causes and conditions in the occurrence of diseases. Their dialectical relationship. The concept of external and internal causes and risk factors of the disease. The concept of the polyetiological nature of the disease.4. General pathogenesis. Damage as the initial link in pathogenesis. Levels of damage: submolecular, molecular, subcellular, cellular, organ-tissue, organismal.5. Reactivity of the body: definition of the concept, types and forms of reactivity. Examples. Methods for assessing reactivity in a patient.6. Resistance of the body: definition of the concept, nonspecific and specific factors of resistance, examples of their violations.7. Constitution of the body: definition of the concept, classification. Dependence of reactivity on the human constitution.8. Factors of external and internal environment influencing reactivity. The importance of studying reactivity.9. Hereditary diseases: general characteristics, classification. Congenital diseases. Phenocopies.10. Pathogenesis of hereditary molecular diseases. Enzymopathies. Examples.11. Etiology of hereditary diseases. The role of genotype and environment in the development of hereditary pathology. Major human chromosomal diseases.12. Types of inheritance of genetic defects: dominant, recessive, sex-linked. Examples.13. Epigenomic diseases: general characteristics, etiology, pathogenesis. Examples of epigenomic diseases.14. Pathogenic effects of chemical factors: exo- and endogenous intoxications. Alcoholism, substance abuse, drug addiction: characteristics of concepts, types, etiology, pathogenesis, manifestations, consequences.	theoretical

15. Pathogenic influence of biological factors; viruses, rickettsia, bacteria and parasites as causes of diseases. Psychogenic pathogenic factors; concept of iatrogenic diseases. The importance of social factors in maintaining health and the occurrence of human diseases.
16. Terminal states. Dying as a staged process. Preagonal state, agony, clinical death, biological death. Pathophysiological basis of resuscitation. Social and deontological aspects of resuscitation.

General pathophysiology

17. General mechanisms of cell damage: damage to cell membranes and enzymes. The role of lipid peroxidation (LPO) in cell damage. Antioxidant system.
18. General mechanisms of cell damage: energy metabolism disorders; imbalance of ions and water in the cell.
19. General mechanisms of cell damage: disruption of the gene and/or gene expression mechanisms. Mechanisms of cell death. Comparative characteristics of apoptosis and necrosis. Examples of increased and insufficient apoptosis in pathology.
20. General mechanisms of cell damage: damage to cell membrane receptors. Disruption of intracellular mechanisms regulating cell function. The role of secondary messengers.
21. Arterial hyperemia: classification, causes and mechanisms of occurrence, main clinical and pathophysiological signs, complications
22. Venous hyperemia: causes and mechanisms of occurrence, main clinical and pathophysiological signs, complications
23. Ischemia. Causes and mechanisms of occurrence. Main clinical and pathophysiological signs. Organ and system disorders caused by ischemia.
24. Thrombosis. Types of blood clots, structure. Causes and mechanisms of formation of various types of blood clots. Manifestations of thrombosis: pulmonary embolism, venous thrombosis.
25. Hemorrhagic conditions caused by pathology of the vascular wall: classification, etiology, pathogenesis, manifestations, diagnostic principles.
26. Thrombocytopenia: classification, etiology, pathogenesis, clinical and laboratory manifestations, diagnostic principles.
27. Thrombocytopathies: classification, etiology, pathogenesis, clinical and laboratory manifestations, diagnostic principles.
28. Coagulopathies: classification, etiology, pathogenesis, manifestations, principles of diagnosis.
29. Blood clots and thrombogenesis. Arterial and venous thrombi: etiology, pathogenesis, manifestations. Outcomes and complications of thrombosis.
30. DIC syndrome: definition of the concept, etiology, pathogenesis, stages, laboratory screening.
31. Thrombocytopenia: classification, etiology, pathogenesis, clinical and laboratory manifestations, diagnostic principles.
32. Thrombocytopathies: classification, etiology, pathogenesis, clinical and laboratory manifestations, diagnostic principles.
33. Inflammation: term, definition of the concept, etiology, local and systemic signs of inflammation, their pathogenesis.
34. Pathogenesis of inflammation: primary and secondary alteration, changes in microvasculature; their pathogenesis and manifestations.
35. Pathogenesis of edema during inflammation. The role of biologically active substances in the regulation of vascular wall permeability. Types of exudates, examples.
36. Inflammatory mediators: classification, sources, role in the formation of inflammation.
37. Leukocyte reactions during inflammation: mechanisms of chemotaxis, adhesion,

emigration.	
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38. The role of leukocytes in inflammation. Phagocytosis, stages. Oxygen-dependent and oxygen-independent killing mechanisms.

39. Stage of proliferation during inflammation: main stages, mechanisms and types of repair, stimulators and inhibitors of proliferation.

40. Chronic inflammation: features of etiology, pathogenesis, examples of diseases. Principles of anti-inflammatory therapy.

41. Characteristics of the concept of "acute phase response". The relationship between local and general reactions of the body to damage. The main mediators of the acute phase response (APR): IL-1, IL-6, TNF; their origin and biological effects. Manifestations of APR: activation of the hypothalamic-pituitary-adrenal system, fever, activation and inhibition of acute phase protein synthesis, acceleration of ESR, increased blood clotting, neutrophilic leukocytosis, increased activity of the immune system, changes in metabolism, etc. Pathogenesis of these changes.

42. Allergy: definition of the concept, classification of allergic reactions according to Jell and Coombs.

43. Allergens: definition of the concept, classification. Routes of entry into the body. The concept of sensitization and desensitization. Drug allergy.

44. Allergic reactions type I (anaphylactic). Examples. Etiology, pathogenesis, principles of prevention and treatment.

45. Allergic reactions type II (cytotoxic). Examples. Etiology, pathogenesis, principles of prevention and treatment.

46. Allergic reactions type III (immune complex). Examples. Etiology, pathogenesis, principles of prevention and treatment. Serum sickness.

47. Allergic reactions type IV (cell-mediated). Examples. Etiology, pathogenesis, principles of prevention and treatment.

48. Anaphylactoid (pseudoallergic reactions). Examples. Etiology, pathogenesis, principles of prevention and treatment.

49. Autoimmune diseases: definition of the concept, etiology, pathogenesis, examples. The role of environmental factors in the development of autoimmune diseases.

50. Primary and secondary immunodeficiency conditions. Etiology, pathogenesis, examples.

51. Fever: definition of the concept, etiology, pathogenesis. Biological significance of fever.

52. Types of febrile reactions, their diagnostic significance. The concept of pyrotherapy. Difference between fever and hyperthermia.

53. Changes in metabolism, function of organs and systems during fever. Biological significance of fever.

54. Hypothermia: definition of the concept, etiology, pathogenesis, manifestations.

55. Hypohydration: classification, etiology, pathogenesis, compensation mechanisms.

56. Overhydration: classification, etiology, pathogenesis, compensation mechanisms.

57. Edema: definition of the concept, types, pathogenesis.

58. Pathogenesis of edema in heart failure.

59. Pathogenesis of edema in nephrotic syndrome.

60. Pathogenesis of inflammatory, hungry and hepatic edema.

61. Acidosis. Classification, etiology, compensation mechanisms, clinical and laboratory manifestations.

62. Alkaloses. Classification, etiology, compensation mechanisms, clinical and laboratory manifestations.

63. Tumor growth: definition of the concept. Tumor as a hyperbiotic process. Benign and malignant tumors.

64. Etiology of tumors: physical, chemical, biological carcinogens. Predisposing factors for the occurrence of tumor diseases.

65. Initiation stage in carcinogenesis. The role of epigenomic changes. The concept of proto-oncogenes, antioncogenes and their products.

66. Promotion stage in carcinogenesis. Tumor atypia and its types.
67. Tumor progression: mechanisms and consequences. Stages of invasive growth and metastasis. Types of metastasis.
68. Disturbances in the protein composition of blood plasma: hyper-, hypo- and disproteinemia; paraproteinemia. Conformational changes of proteins.
69. Disorders of the metabolism of purine and pyrimidine bases. Gout: the role of exo- and endogenous factors, pathogenesis.
70. Hyperglycemic conditions: types, mechanisms of development, significance for the body.
71. Hypoglycemic conditions: types, mechanisms of development, significance for the body. Hypoglycemic coma.
72. Diabetes mellitus: definition of the concept, classification, criteria. Mechanism of action of insulin.
73. Insulin-dependent diabetes mellitus: etiology, pathogenesis.
74. Non-insulin-dependent diabetes mellitus: etiology, pathogenesis.
75. Diabetes mellitus: pathogenesis of manifestations, principles of prevention and therapy.
76. Diabetic comas: ketoacidotic, hyperosmolar, lactic acidemic. Their pathogenesis, manifestations.

Particular pathophysiology

77. Anemia: definition of the concept, principles of classification, clinical and hematological manifestations.
78. Acute posthemorrhagic anemia: etiology, pathogenesis, principles of laboratory diagnosis.
79. Iron deficiency anemia: etiology, pathogenesis, manifestations, principles of laboratory diagnosis.
80. Hypoplastic anemia: etiology, pathogenesis, manifestations, characteristics of hematopoiesis and principles of laboratory diagnosis.
81. Vitamin B12 deficiency and folate deficiency anemia: etiology, pathogenesis, clinical manifestations, characteristics of hematopoiesis and principles of laboratory diagnosis.
82. Acquired hemolytic anemia: etiology, pathogenesis, manifestations, characteristics of hematopoiesis and principles of laboratory diagnosis.
83. Congenital hemolytic anemia: classification, etiology, pathogenesis, manifestations, characteristics of hematopoiesis and principles of laboratory diagnosis.
84. Erythrocytosis: types, etiology, pathogenesis.
85. Leukocytosis: types, etiology, pathogenesis, diagnostic value of the leukocyte formula.
86. Leukopenia: types, etiology, pathogenesis. Clinical manifestations. Agranulocytosis.
87. Leukemia: definition of the concept, classification, etiology, pathogenesis, manifestations, principles of diagnosis.
88. Leukemoid reactions: types, etiology, pathogenesis, differences from leukemia.
89. Myeloproliferative diseases: definition of the concept, classification, principles of diagnosis.
90. Primary arterial hypertension (hypertension): etiology, pathogenesis, stages and complications.
91. Secondary (symptomatic) arterial hypertension: types, causes and main mechanisms of their development.
92. Atherosclerosis: definition, etiology (risk factors). The role of dyslipidemia, arterial hypertension, diabetes mellitus, smoking in atherogenesis.
93. Atherosclerosis: pathogenesis, stages. Clinical consequences of atherosclerosis.
94. Heart failure: definition of the concept, classification, etiology.

<p>95. Heart failure: pathogenesis of clinical manifestations, changes in hemodynamic parameters.</p> <p>96. Pathogenesis of chronic heart failure: mechanisms of compensation and decompensation.</p> <p>97. Stages of pathological myocardial hypertrophy, their pathogenesis. The concept of cardiac remodeling in chronic heart failure.</p> <p>98. Acute heart failure: etiology, pathogenesis, main clinical manifestations of acute right and left ventricular heart failure.</p> <p>99. Coronary insufficiency, absolute and relative, reversible and irreversible. The concept of cardinal reperfusion syndrome in reversible coronary insufficiency</p> <p>100. Acute myocardial infarction: pathogenetic variants, stages of development, main complications and clinical signs</p> <p>101. Causes, pathogenesis and ECG signs of nomotopic arrhythmias: sinus tachycardia, sinus bradycardia</p> <p>102. Extrasystole, paroxysmal tachycardia, atrial and ventricular fibrillation - causes, pathogenesis and ECG signs</p> <p>103. Ventilation form of respiratory failure: etiology, pathogenesis. Respiratory distress syndrome in adults.</p> <p>104. Ventilatory form of respiratory failure: disturbance of central regulation of breathing. Pathological types of breathing, pathogenesis of development</p> <p>105. Perfusion form of respiratory failure: etiology, pathogenesis. Pulmonary hypertension: mechanism of development and compensation, consequences.</p> <p>106. Dyspnea: definition of the concept, pathogenesis. Pathological types of breathing, pathogenesis of development</p> <p>107. Pulmonary edema: causes, mechanisms of development. Cardiogenic and non- cardiogenic pulmonary edema.</p> <p>108. Violation of the motor, evacuation and secretory functions of the stomach: etiology, mechanisms of development, manifestations and consequences.</p> <p>109. Peptic ulcer of the stomach and duodenum. Definition of the concept, etiology. The role of Helicobacter pylori.</p> <p>110. Peptic ulcer of the stomach and duodenum: pathogenesis, complications.</p> <p>111. Consequences of gastrointestinal surgery. Dumping syndrome, short bowel syndrome, consequences of vagotomy: etiology, pathogenesis of manifestations.</p> <p>112. Maldigestion and malabsorption syndrome: etiology, pathogenesis. Intestinal enzymopathies.</p> <p>113. Hemolytic and obstructive jaundice: etiology, pathogenesis, diagnostic criteria.</p> <p>114. Parenchymal jaundice: etiology, pathogenesis, diagnostic criteria. Enzymopathic jaundice.</p> <p>115. Portal hypertension: definition of the concept, etiology, classification, pathogenesis of the main symptoms. Cirrhosis of the liver.</p> <p>116. Etiology, pathogenesis of disturbances in filtration, reabsorption, secretion and composition of urine in cases of impaired renal function.</p> <p>117. Acute renal failure: definition of the concept, etiology, pathogenesis, clinical and laboratory criteria, manifestations.</p> <p>118. Nephrotic syndrome: definition of the concept, etiology, pathogenesis, clinical and laboratory manifestations.</p> <p>119. Nephritic syndrome: definition of the concept, etiology, pathogenesis, clinical and laboratory manifestations.</p> <p>120. Chronic renal failure: definition of the concept, etiology, pathogenesis, manifestations. The concept of dialysis and kidney transplantation.</p> <p>121. General etiology and pathogenesis of endocrinopathies. Disturbances of central regulatory mechanisms. Disturbance of transpituitary regulation of internal secretion. Dysfunction of parapituitary regulation. The role of the feedback mechanism.</p>	
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122. Pathological processes in the endocrine glands: infectious processes and intoxication; tumor processes; genetically determined defects in hormone biosynthesis.

<p>123. Peripheral (extraglandular) mechanisms of disruption of the implementation of hormone effects. Disturbances in the binding and “release” of hormones by proteins. Blockade of circulating hormones and hormonal receptors.</p> <p>124. Hypofunction and hyperfunction of the thyroid gland. Myxedema. Cretinism. Graves' disease. Causes of occurrence. Pathogenesis of disorders.</p> <p>125. Hyper- and hypofunction of the parathyroid glands. Etiology, pathogenesis, clinical signs.</p> <p>126. Dysfunction of the genital glands. Etiology, pathogenesis, clinical signs.</p> <p>127. Pain, meaning for the body. Somatic and visceral pain. Mechanisms of occurrence. Zakharyin-Ged zones. The role of nociceptive and antinociceptive systems in the formation of pain.</p> <p>128. Pathology of higher nervous activity. Neuroses. Types of neuroses. Causes of occurrence. Methods for obtaining neuroses in experiments. Psychotherapy.</p> <p>129. Etiology of movement disorders. Central and peripheral paralysis, their characteristics.</p> <p>130. Impaired sensitivity. Types. Characteristics and mechanisms of anesthesia, hyperesthesia, paresthesia. Dissociated type of sensitivity disorder. Brown-Séquard syndrome</p>	
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